enough to produce conversion to the generalized pustular form, with its attendant risks of severe systemic illness. We think that our experience should sound a note of caution in the prescribing and withdrawal of such a potent preparation.

¹ Baker, H., and Ryan, T. J., *British Journal of Dermatology*, 1968, 80, 771.

Department of Dermatology, North Staffordshire Hospital Centre, Stoke-on-Trent ST4 7PA

J. D. BOXLEY, M.B., M.R.C.P., Senior Registrar

R. P. R. DAWBER, M.B., M.R.C.P., Consultant Dermatologist

R. SUMMERLY, M.B., F.R.C.P., Consultant Dermatologist

Costing Cryoprecipitate for Haemophilia

Though haemophilia is rare, affecting two to three males per 100 000 of the population, the management of patients presents a continuing problem. The only effective treatment is replacement of the anti-haemophilic factor (A.H.F. factor VIII) which the patient lacks. There are two main sources of this material—cryoprecipitate, which can be made in regional blood transfusion laboratories, or A.H.F. concentrates which may be bought from commercial sources or made in national blood products laboratories. Nationally-made A.H.F. concentrates are not yet made in sufficient quantity to meet the haemophilic needs of all regions. Hence in most haemophilic centres they have to decide between using cryoprecipitate or commercial A.H.F. concentrates. We present here a study of the cost of cryoprecipitate production in the West of Scotland Regional Blood Transfusion Laboratory, Carlisle.

Methods and Results

Cryoprecipitate is prepared here by a slight modification of the original method of Pool *et al.*¹ Occasionally blood platelets may also be produced by addition of a centrifugation step before freezing the plasma. About half of the cryoprecipitate used in the west of Scotland is prepared in the blood transfusion centre in West Regent Street, Glasgow, which is what we costed (see table). As cryoprecipitate is an additional product, the cost of collecting blood is immaterial. Only the extra costs incurred in preparing cryoprecipitate need be assessed—including wages and salaries, materials, equipment, and overheads.

In 1973 8680 packs of cryoprecipitate out of a regional total of 20 000 were prepared at the centre. Of these about 3000 were produced jointly

with platelets. The average yield of A.H.F. units per pack was 80. A total annual cost of £14 658 gives a cost per pack of cryoprecipitate of about £1.69 and a cost per unit of A.H.F. of just over 2p.

Discussion

Though replacement of antihaemophilic factor will rapidly control haemophilic bleeding, only about 10% of haemophilic patients receive optimum treatment for their disease.²

The major disadvantages of cryoprecipitate are (a) the factor VIII level is not known, (b) recovery is variable and unpredictable, (c) reconstitution is time-consuming and tiresome, (d) it must be stored in a deep freeze, and (e) there is an appreciable incidence of allergic reactions. Hence much effort has gone into the search for a more potent concentrate of A.H.F. and the U.K. now has three commercial sources of such concentrates. Their advantages are that the material is preassayed and a predicted dose can be given to the patient; it is freeze-dried and, therefore, much more stable; and because of the high concentration, the predicted dose can be injected by syringe in a small volume. This makes concentrates very suitable for self-administration and hence for home treatment. Perhaps the major disadvantage is cost (about 10p per A.H.F. unit), which is about five times our estimate for cryoprecipitate.

There are no accurate figures available for the cost of treating all haemophiliacs in the United Kingdom. In our region we have 232 patients with a diagnosis of haemophilia. Nevertheless, 80% of the 20 000 packs of cryoprecipitate are needed for only 40 of the regular attenders—that is, the more severely affected patients. Ninety-five per cent. of the material used in the period surveyed was cryoprecipitate (cost £33 800). If commercial concentrate had been used exclusively the cost would have been £160 000. If these figures are projected to national requirements the cost of cryoprecipitate would be £676 000, compared with £3.2m for commercial concentrates. But this level of treatment is unsatisfactory in at least 90% of patients.

In the current financial climate we must strike a compromise and use commercial A.H.F. concentrates for home treatment where it is most effective, and use the very much cheaper cryoprecipitate in the haemophilic centres where some of its main disadvantages may be overcome.

¹ Pool, J. G., Hershgold, E. J., and Pappenhagen, A. R. *Nature*, 1964, 203, 312.

² Biggs, R., *Lancet*, 1974, 1, 1339.

An appendix with detailed notes of the figures used in the costing is available from the authors.

Health Services Operational Research Unit, University of Strathclyde, Glasgow G4

FELICITY CARTER, B.Sc., M.Sc., Research Assistant
J. MACFARLANE, B.Sc., Director

University Department of Medicine, Royal Infirmary, Glasgow G4 OSF

C. D. FORBES, M.D., F.R.C.P., Senior Lecturer

C. R. M. PRENTICE, M.D., M.R.C.P., Honorary Consultant Physician

Regional Blood Transfusion Service, Law Hospital, Carlisle, Lanarkshire

J. WALLACE, F.R.C.P., M.D., Director, West of Scotland Blood Transfusion Service

Breakdown of total annual cost of preparing cryoprecipitates

Item	Annual cost	%
Wages and Salaries	£6901	47.1
Materials (i) transfusion packs	4411	30.1
(ii) other materials	1056	7.2
Equipment (i) capital cost	1095	7.5
(ii) maintenance	170	1.1
Overheads	1025	7.0
Total	14 658	100.0